

## REMARKS

### Status of the Claims

#### *Pending claims*

Claims 1, 5, 8, 9, 16, 18, 24, 27, 31, 34-36, 40, 43, 45, 49, 51, 52, 54, 55, 58-61, 68, 70, 76, 77, 81, 86, 87, 91, 93-95, 97-99, 101, 103, 106, 107, 111, 121, 123, 126, 136, 137, 141, 145, 146, 151, 153, 158, 160, 163-166, 169, 170, 173, 174, 177-179, 190, 191, 194-197, 199, 201, 203-205, 208, 209, 212, 214-216, 218-221, 223-226, 229 and 231-235 are pending.

#### *Claims canceled or added in the instant response*

Claims 5, 8, 18, 58-60, 70, 77 and 234-235 are canceled.

Claims 236 to 241 are added.

Thus, after entry of the instant amendment, claims 1, 9, 16, 24, 27, 31, 34-36, 40, 43, 49, 51-52, 54-55, 61, 68, 76, 81, 86, 87, 91, 93-95, 97-99, 101, 103, 106, 107 111, 121, 123, 126, 136, 137, 141, 145, 146, 151, 153, 158, 160, 163-166, 169, 170, 173, 174, 177-179, 190, 191, 194-197, 199, 201, 203-205, 208, 209, 212, 214-216, 218-221, 223-226, 229, 231-233 and 236-241 will be pending.

Applicants respectfully request entry of the amendments set forth in this response.

### Support for the Claim Amendments

The specification sets forth an extensive description of the invention in the amended claims. Accordingly, Applicants respectfully submit that no new matter is introduced by the instant amendment.

### Group Restriction Requirements

The Office alleged that the pending claims of the application are directed to thirty-one (XXXI) separate and distinct inventions under 35 U.S.C. §121, as set forth in detail on pages 2 to 4 of the OA. The Office also requires Species Elections for: a specific biological sequence, as set forth in detail on pages 4 to 6, of the OA; and, a specific activity, as set forth in detail on pages 4 to 5, of the OA.

The Elections – with traverse

Group election: In response to the Group Restriction Requirement, Applicants elect Group I, claims 1, 9, 16, 18, 24, 27, 31, 35, 36, 40, 49, 52, 94, 101, 165, 204 and 205 (and claims 236-241 after entry of the instant amendment), drawn to, inter alia, compositions and methods of this invention as noted on page 2 of the OA, with traverse.

*Rejoining process claims under In re Ochiai*

Applicants respectfully request that after the elected product claims of Group I have been found to be allowable, all withdrawn process (method) claims which depend from or otherwise include all of the limitations of the allowed product claims should be rejoined. MPEP §821.04, §821.04(a), §821.04(b); pgs 800-64 to 800-71, 8th Edition, rev. 5, vol. 1, August 2006; In re Ochiai, 37 USPQ2d 1127 (Fed. Cir. 1995); In re Brouwer, 37 USPQ2d 1663 (Fed. Cir. 1995); 1184 OG 86, 3/26/96.

Sequence election for biological sequences: In response to the Species Election Requirement, as discussed on page 4 of the OA, Applicants elect the genus of polynucleotides based on the exemplary SEQ ID NO: 77, which encode, inter alia, the exemplary SEQ ID NO: 78, with traverse.

As noted by the Office, a reply to this requirement must, in addition to an identification of the species that is elected, also include a listing of all claims readable thereon. Claims 1, 9, 16, 18, 24, 27, 31, 35, 36, 40, 49, 52, 94, 101, 165 and 205 (and claims 238-240 after the instant amendment) are claims readable thereon.

Election for specific activity: In response to this Species Election Requirement, as discussed on page 4 to 5 of the OA, Applicants elect the genus of polynucleotides based on the nucleotides having a pectate lyase activity, with traverse.

As noted by the Office, a reply to this requirement must in addition to an identification of the species that is elected also include a listing of all claims readable thereon. Claims 1, 9, 16, 18, 24, 27, 31, 35, 36, 40, 49, 52, 94, 101, 165, 204 and 205 (and claims 238-240 after the instant amendment) are claims readable thereon.

Reasons to reconsider and withdraw restriction requirement, in part

Applicants respectfully request the Patent Office reconsider and withdraw the restriction requirement for the following reasons:

*Election of Group I, with Traverse*

Applicants respectfully request the Patent Office rejoin all claims pending after entry of the instant amendment, including claims from Groups II to XXXI for the following reasons:

The Office alleged that due the breadth of the pending claims (in particular, the breadth of the claimed genus of biological sequences), in light of van der Hoeven et al. (2001), the pending claims lack a novel inventive concept (see, e.g., page 6 of the OA).

The instant amendment addresses this issue; after entry of this amendment, all pending claims will share a novel inventive concept, where the novel inventive concept is based on the genus of polypeptides based on the exemplary SEQ ID NO:78, encoded, for example, by the genus of polynucleotides based on the exemplary SEQ ID NO: 77.

This application is a §371 national phase application and restriction is evaluated under:

*PCT RULE 13*  
*Unity of Invention*

*PCT RULE 13.1.*  
*Requirement*

The international application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept ("requirement of unity of invention").

*PCT RULE 13.2.*

*Circumstances in Which the Requirement of Unity of Invention Is To Be Considered Fulfilled*  
Where a group of inventions is claimed in one and the same international application, the requirement of unity of invention referred to in Rule 13.1 shall be fulfilled only when there is a technical relationship among those inventions involving one or more of the same or corresponding special technical features. The expression "special technical features" shall mean those technical features that define a contribution which each of the claimed inventions, considered as a whole, makes over the prior art.

Further direction is provided in MPEP 1893.03(d) (MPEP Eighth Ed, Rev. 3, Aug. 2005, page 1800-200, 201):

**MPEP 1893.03(d) Unity of Invention [R-2] - 1800 Patent Cooperation Treaty**

A group of inventions is considered linked to form a single general inventive concept where there is a technical relationship among the inventions that involves at least one common or corresponding special technical feature. The expression special technical features is defined as meaning those technical features that define the contribution which each claimed invention, considered as a whole, makes over the prior art. For example, a corresponding technical feature is exemplified by a key defined by certain claimed structural characteristics which correspond to the claimed features of a lock to be used with the claimed key.

Applicants respectfully aver that after entry of this amendment all pending claims in this application satisfy PCT Rule 13.2 in that they will share the novel inventive concept based on the genus of polypeptides based on the exemplary SEQ ID NO:78, encoded e.g. by the genus of polynucleotides based on the exemplary SEQ ID NO:77. This includes all sequence variants because they all fall within the scope of the claimed (as amended) and elected genus of biological sequences based on the exemplary SEQ ID NO: 77 and SEQ ID NO:78.

*Species Elections, with Partial Traverse*

Applicants respectfully request that the Office withdraw the species election requirement among SEQ ID NOS: 77, 131 and 133. Applicants respectfully point out that SEQ ID NO: 77 is a nucleic acid sequence which encodes the polypeptide of SEQ ID NO: 78. SEQ ID NO: 78 is a 680 amino acid sequence obtained from an environmental sample and it is the parental sequence for the shorter SEQ ID NO: 132 (encoded by the polynucleotide sequence set forth in SEQ ID NO: 131), which also has pectate lyase activity. Amino acids 359-680 of SEQ ID NO: 78 are identical to the amino acids set forth in SEQ ID NO: 132, except that SEQ ID NO:132 has an added start (Methionine) at the beginning. SEQ ID NO:132 (encoded by SEQ ID NO:131) was used as a parental sequence to generate mutated SEQ ID NO:134 (encoded by SEQ ID NO:133), which also has pectate lyase activity. SEQ ID NO:132 and SEQ ID NO:134 share 97.5% sequence identity, while SEQ ID NO:131 and SEQ ID NO:133 share 98% sequence identity (as determined by the BioEdit Sequence Alignment Editor software version 5.0.9, using the default alignment parameters). Therefore, Applicants respectfully request that the Office consider that SEQ ID NOS: 78, 132 and 134, the nucleic acid sequences encoding them (SEQ ID NOS: 77, 131 and 133, respectively) and their applications to possess unity of invention under PCT Rule 13.2, and withdraw the species election requirement as to these sequences.

Applicants respectfully request that the Office consider that the activities including beta-elimination, of pectate lyase, of poly (1,4-alpha-D-galacturonide) lyase and of polygalacturonate lyase are not patentably distinct activities. Applicants respectfully aver that a person skilled in the art would know that lyases are enzymes that catalyze eliminative (e.g. trans- and beta-eliminative) cleavage of molecules. Further, Applicants respectfully aver that pectate lyase, poly (1,4-alpha-D-galacturonide) lyase and polygalacturonate lyase are all synonyms for the same

enzyme, each having the Enzyme Commission (EC) classification 4.2.2.2. Therefore, Applicants respectfully request that the Office withdraw the species election requirement as it pertains to the pectate lyase activities including beta-elimination, of pectate lyase, of poly (1,4-alpha-D-galacturonide) lyase and of polygalacturonate lyase.

### CONCLUSION

Applicants have respectfully averred that after entry of this amendment all pending claims in this application satisfy PCT Rule 13.2 in that they will share the novel inventive concept based on the genus of polypeptides based on the exemplary SEQ ID NO:78, encoded e.g. by the genus of polypeptides based on the exemplary SEQ ID NO:77. Further, Applicants respectfully aver that nucleotide sequences set forth in SEQ ID NOS: 77, 131 and 133 and their corresponding polypeptides (SEQ ID NOS: 78, 132 and 134) are patentably indistinct species. Finally, Applicants respectfully aver that pectate lyase activities including catalysis of beta-elimination, pectate lyase, poly (1,4-alpha-D-galacturonide) lyase and of polygalacturonate lyase activity are also patentably indistinct species of the present invention.

Applicants have set forth distinct and specific errors in the species restriction requirement and reasons for the Patent Office to reconsider and withdraw the species restriction requirement. Accordingly, Applicants have preserved their right to petition the restriction to the Group Director under 37 CFR §1.144; see also MPEP §818.03(c), pg 800-60, 8th Edition, Rev. 2, May 2004.

It is believed that the all claims pending in this application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark Office determines that an extension and/or other relief is required, applicants petition for any required relief including extensions of time and authorize the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 50-0661** referencing docket

no. D2000-1WUS. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Dated: December 4, 2007

Respectfully submitted,

By: /lynnmlinkowski/  
Lynn M. Linkowski  
Registration No.: 47,320  
VERENIUM CORPORATION  
Intellectual Property Department  
P.O. Box 910550  
San Diego CA 92121-0550  
Phone: (858)526-5450  
Fax: (858)526-5950  
email: [lynn.linkowski@verenium.com](mailto:lynn.linkowski@verenium.com)